

ENTANGLED CO-DESIGN WITH A TRICKSTER: SPECULATIVE FRAMING AND REFRAMING

Vanessa Svihla, Megan Jacobs, Tim Castillo, Mary Tsiongas, Leah Buechley, Drew Trujillo, Amy Traylor, Megan Tucker, Reuben Fresquez, Jaziel Cervantes-Carreon, & Sydney Nesbit, *University of New Mexico*

Speculative design, as a diverse set of methods that aim to offer critique, can be challenging to engage productively. In this design case, we share how a prior, stalled design project—an ambitious vision of interdisciplinary design education partnered with business and housing development projects in Santa Fe, New Mexico—provided compelling precedent as we sought to reframe during the COVID-19 pandemic. We recognized that solution-focused ways of working in the prior project left the design problem undefined. As we began the design work detailed in this case, we leveraged the perspectives and design knowledge of our interdisciplinary team of faculty and students. While design cases often emphasize the designed training or program, we focus on our reframing process, sharing vignettes as we prepared to and participated in activities at a design workshop, and then used our own design practices to engage in problem framing workshops. In sharing these accounts, we characterize the pandemic as a trickster and speculative co-designer, who revealed much about how our efforts were entangled with institutional structures. Across these punctuated vignettes of design work, we highlight how an initial broad problem frame invited this trickster to participate and how the application of problem framing tools wrested framing agency from the trickster. Collectively, this anchored our attention to systemic inequities in ways that troubled notions of sustainability.

Vanessa Svihla is an associate professor of learning sciences and engineering at the University of New Mexico. Their research focuses on how people learn as they design.

Megan Jacobs is an associate professor in honors college at the University of New Mexico, with a focus on art and material culture.

Tim Castillo is a professor of architecture and a former associate dean at the University of New Mexico. His work focuses on the intersection of emerging digital technologies, fabrication, and culture.

Mary Tsiongas is a professor of experimental art at the University of New Mexico, whose work explores human relationships with the wilderness and technology.

Leah Buechley is an associate professor in computer science at the University of New Mexico. Her research sits at the intersection of computer science, design, art, and learning.

Drew Trujillo is a graduate student pursuing a Master of Fine Arts at the University of New Mexico and a former director of an innovative arts and entertainment organization. His work explores technology, movement, and sound.

Amy Traylor is a Ph.D. student in computer science at the University of New Mexico. Her work focuses on the intersection of programming and arts.

Megan Tucker is a Ph.D. student in learning sciences at the University of New Mexico. She is an instructional designer at the university.

Reuben Fresquez is a master's student in computer science at the University of New Mexico.

Jaziel Cervantes-Carreon is a graduate student pursuing a Master of Architecture at the University of New Mexico.

Sydney Nesbit is pursuing a graduate degree in architecture at the University of New Mexico. Her art explores human relationships with technology.

Copyright © 2024 by the International Journal of Designs for Learning, a publication of the Association of Educational Communications and Technology. (AECT). Permission to make digital or hard copies of portions of this work for personal or classroom use is granted without fee provided that the copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page in print or the first screen in digital media. Copyrights for components of this work owned by others than IJDL or AECT must be honored. Abstracting with credit is permitted.

<https://doi.org/10.14434/ijdl.v15i1.33820>

INTRODUCTION

Compared to many design cases, this story is somewhat different. We cannot begin by detailing what the design problem was that we set out to understand and solve because we did not initially frame a problem. Indeed, our challenges in framing the problem are the central focus of this design case.

Prior to the COVID-19 pandemic, we put forth a proposal for *The Aquifer in Santa Fe* as a place-based site of exchange emphasizing reciprocity and design learning, serving as the nexus between New Mexico's many dichotomies, and creating a mechanism for cross-pollination. Multiple factors—the pandemic, assessment of the proposed site, barriers to interdisciplinary collaboration—clarified a need to reframe and redesign. In this design case, we particularly detail this reframing process and how we incorporated various design practices, including speculative design (Auger, 2013; Hunt, 2011). Speculative design methods bridge the crevasse of the unknown between current, unsatisfactory situations and more equitable futures; indeed, this could describe any design problem in which innovation and equity are valued. In this design case, we explore some of the tensions—uncertainty navigation, fixation of various kinds, and shifting near-term constraints—that prompted our use of speculative methods. We describe how this supported us to reframe problems.

All the authors contributed to the design reported in this case. The team included tenured faculty from learning sciences, architecture, art, honors college, and computer science, all at the same research university in New Mexico. The faculty member from architecture, who held a leadership position within his college, was tasked to assemble and lead our team. Most of us have formal design training, situated within our specific disciplines (i.e., faculty in architecture take multiple classes in architectural design; faculty in learning sciences take courses in instructional/learning design and research design, etc.). Likewise, we are engaged in design and design education in varied ways that reflect our disciplines: the learning scientist develops new design methods, studies how people learn as they design, and teaches both instructional/learning design and first-year engineering design. The faculty member from the honors college teaches project-based classes that engage students in designing solutions for communities. The faculty from architecture, art, and computer science teach design in their respective disciplines. Several of us also engage as designers, complementary to our work as faculty. We all also value interdisciplinary approaches, a characteristic that brought us together and that shaped our roles; specifically, we had different perspectives but relatively undifferentiated roles, compared to many design teams that include designers, developers, and trainers. Each faculty member invited a student from their program to join the team in summer 2021. This

included graduate students with substantial professional design experience, as well as an undergraduate interested in the topic. We detail their roles in sharing the story of our process.

The learning scientist drafted this case, relying heavily on co-created team documents, notes, recordings, and artifacts. Every author made intellectual contributions to the text, in its form as a design case and/or as authors of source material on which the case is based.

Finally, we position the COVID-19 pandemic as a speculative co-designer. While we could instead cast the pandemic as context rather than designer, increasing attention to nonhuman and material agency has highlighted the value of extending analysis beyond human interactions or even contextual analysis (Cerulo, 2009), a stance that broadens the notion of design as a conversation *with* materials (Schön, 1992), and a stance that resonates for us. Scholars have long argued that agency is not just a property of an individual, but rather, that it should be understood as situated and distributed (Knappett & Malafouris, 2008; Wertsch et al., 1993). For instance, the designer may negotiate agency with clients and stakeholders, as well as the materials and contexts of use during the design process. We, therefore, consider design to be a productive “zone of entanglement” (Ingold, 2008) in which aspects of context are not a mere backdrop, but are agential in framing design problems. In this way, we consider the speculative pandemic designer as something of a trickster character—an archetype across many cultures' folklore who is “(1) the fundamentally ambiguous and anomalous personality [...] (2) deceiver/trick-player, (3) shape-shifter, (4) situation-inventor, (5) messenger/imitator of the gods” (Hynes & Doty, 1997, p. 34). Tricksters are marginal and outsider actors (Babcock-Abrahams, 1975), never fully integrated into the communities they alter with the power of “ambiguity and autonomy of the unknown” (Babcock-Abrahams, 1975, p. 186). In this way, speculative design has much in common with the cunning, crafty, rule-breaking tricksters of folklore (Fisher, 2012). Our intention in framing our process in this manner is not to offer a post-hoc interpretive and scholarly analysis of design methods, but rather to render the context of the pandemic more concrete as a consequential actor in our design process.

To illustrate our speculative design work as entangled with the pandemic as a co-designer, our paper focuses on the design process. In contrast to many design cases, we do not offer a vicarious depiction of a final designed outcome, but rather, focus on sharing our process vividly.

CONTEXT

We share how prior design work, which several of the authors participated in, shaped the context of our design

work, and how context shifted and was viewed differently by members of the team.

Prior Design Context

The context of our design prior to the pandemic was centered in Santa Fe, New Mexico, but with a vision of jointly serving more areas within our large, rural state than our urban university typically reaches out to and leveraging the draw of Santa Fe to bring others in. New Mexico, the fifth largest US state, yet 46th in population density, is sometimes characterized by its dichotomies, contrasting extreme financial wealth and poverty, extremes in educational attainment, as well as geographic diversity. In this, we envisioned Santa Fe as a crossroads where we could bring people together, building on the creativity and diverse cultures of the state.

The original vision of *The Aquifer in Santa Fe* was formed in response to an early 2019 call for proposals by the city of Santa Fe for ways to redevelop a vacant campus. At the time, the campus had been vacant for one year. Most of our team had never visited the site. The city provided information about the site and guidelines that emphasized a vision of culture, heritage, diversity, and creativity in a multi-use (education, business, residences) space (City of Santa Fe, 2018). The team that shaped this vision included university faculty from many design disciplines across campus, including several of the authors of this design case.

Our institution is designated as Hispanic-serving, community-engaged, and very high research. We do not have a dedicated design school, but design is taught across many of our academic programs in discipline-specific ways. Compared to most research universities, we serve a high percentage of students who are first-generation college attendees (nearly half), who belong to minoritized racial and ethnic groups (over 60%), and/or who have caregiving responsibilities. Only 7% of our students live in campus housing.

Our proposal included new degree programs that could jointly draw outsiders in and build local capacity related to design. We envisioned leveraging the cultures and local examples of global challenges as design issues that could be addressed by interdisciplinary and transdisciplinary teams. We planned a highly interactive, place-based, and collaborative suite of educational experiences—a vision at odds with the COVID-19 pandemic.

Members of the original team proposed precedent, sometimes whole-cloth, resulting in (a) a laundry list of existing programs that could be expanded, (b) an ambitious plan for several new degree programs, and (c) a constellation of new educational experiences: Brief “enchantments”—free, interactive sessions open to anyone—were proposed as teasers to get the word out about other offerings. Hybrids would be mostly online, supplemented by an early, extended face-to-face session to build a learning community,

form teams, and introduce a project; one-to-three intensive all-day sessions for students to work together and with faculty guidance; and a final exhibition of learning. Interdisciplinary co-labs were envisioned as 1-credit courses that would co-locate students from two or more traditional courses. Proctored by a faculty of practice from the local community, the students would work in interdisciplinary cross-training teams to solve a problem that requires content from multiple disciplines. Transdisciplinary hackathons, ideas labs, & charrettes would then engage these students in short, intensive experiences to build their skills in framing and solving authentic problems, using ethical reasoning to consider unintended consequences, and understanding stakeholders’ needs. Unseminars were proposed as involving a high degree of learner choice and self-direction, while still offering coherence and guidance from experts. Using a template outlining requirements related to information gathering, problem-solving, and communication, students would choose activities and deliverables from a menu of options that would constitute their coursework. They would identify a faculty mentor at the university and another mentor who could provide insight into the problem, such as a community member, a local business owner, or an expert from the national labs. Finally, capstones were proposed as a culmination, where students would complete an authentic project, with the scope of work appropriate to the degree level and focus. While approved and evaluated by a faculty supervisor, the worksite supervisor and a faculty of practice would provide formative feedback.

Our proposal—delivered in late 2019—was chosen by the city. This meant that the business and residential developers were expected to incorporate our ideas into their proposals. Likewise, it meant that our plan was contingent on their developments as well.

Pandemic Pivot

Despite the pandemic, the city moved forward, and in May 2020, selected a developer, who then conducted a more careful site inspection. Entangled with increased risk related to economic changes brought by the COVID-19 pandemic, the developer backed out in January 2021, expressing significant concerns about the site and the costs to redevelop it.

A new team was then formed by the university provost to reconsider and reframe, again led by the faculty member from architecture. Rather than depicting the entire design process, this design case focuses on the reframing process that began in January 2021 and occurred as planning sessions and a sequence of design sprints through August 2021. The first sprint was conducted as part of Elon University’s *Design Forge*, a two-day workshop that engaged teams across North America in exploring issues related to place and equity in their design projects. We share our preparation for the first design sprint, individual and joined framing in a

zine exercise, and stakeholder and futures exercises at the *Design Forge*. The second sprint focused on problem framing and included speculative methods. We share a formal design problem statement following work done during the second sprint and our use of a speculative ideation method. The third, solution-focused sprint resulted in a partial proposal.

The context shifted across these design sprints and across designers. We variably focused on New Mexico in general, on our urban campus in particular, on the original vacant campus, and on Santa Fe in general.

REFRAMING PROCESS

Reflecting And Planning For Speculative Design

We began the reframing process in early spring 2021, set in motion by the university's provost and guided by our knowledge of the nature of design. Specifically, we planned our initial work influenced by research on design problem framing, design thinking, ideation and fixation, and speculative design. Compared to the tasks and techniques of solving problems, understanding design problem framing is relatively nascent. We therefore also drew on our experiences as designers.

The ill-structured nature of design problems (Jonassen, 2000) means they can carry significant ambiguity, and designers use their abductive reasoning—termed *design thinking*—built from prior precedent and preferences, and often deployed as tentative solution conjectures, to shape the problem space (Dorst, 2011). In this process, designers use their *framing agency* to make decisions consequential to the problem frame (Svihla et al., 2019; Svihla & Peele-Eady, 2020; Svihla et al., 2021). For instance, in our original approach, we had foregrounded known constraints to bound the problem space, especially since for most faculty, commuting to Santa Fe on a regular basis would not be feasible.

In reflecting on the original proposal, we recognized that we had designed a solution without really framing the problem. Framing design problems involves learning about situations from varied points of view, yet remaining open and tentative such that the problem can co-evolve with and into a solution (Dorst, 2019). In our original proposal, we folded many ideas together into a creative solution that might have been embraced had it not been for the pandemic. However, we had gathered little input from stakeholders, an issue we sought to remedy in our reframing.

We therefore committed to bringing students onto the team and to holding listening sessions with local industry. The students both provided their points of view as students and as community members and gathered information to support the process, such as identifying precedent at our university and others and investigating market needs.

We took advantage of an opportunity to attend Elon University's *Design Forge* as a way to get started. Yet, in reflecting on the vision and aims we submitted in our application to the *Design Forge*, we notice how anchored we were to the original vision produced for *The Aquifer in Santa Fe*:

"Drawing from diverse traditions and cultures and the resourceful approaches of the state at large, we envision place-based, culturally-sustaining design methods that address pressing local instantiations of persistent, global issues (climate change, systemic oppression, disinformation) using inter/transdisciplinary collaborative work. Engaging with and planning for an ever-evolving future in these ways necessitates development of boundary-crossing collaborative skills, including the capacity to reframe problems and to work and communicate with stakeholders in innovative and culturally-sustaining ways. To begin this work, we must first look inward, as our institution is proud to be Carnegie-classified as community-engaged, federally-recognized as Hispanic-serving, yet our institution presents a microcosm of persistent problems.

GOAL 1: Form a local cadre of interdisciplinary design experts supported by a distributed network of relevant organizations and experts.

GOAL 2: Understand key barriers to interdisciplinary design-focused collaboration."

The breadth of this problem frame was fecund and inviting ground for a trickster. Such a broad problem frame allowed some designers to hold onto the original place-based vision, while others tended to treat the idea of place-based as untenable. Across the discussions and design work shared in the next sections (*Design Forge through Solution-Focused Sprint*), it became clear that all members of the design team were willing to take up the original place-based idea, at least tentatively. Perhaps buoyed by optimism tied to the vaccine, this potentially problematic frame—given the known poor conditions of the site—was an expression of "radical hope" (Bendor, 2018), and one very much informed by the pandemic, which had played out issues related to systemic oppression and disinformation on both global and local stages.

We also recognized that by not engaging stakeholders in our original proposal, we risked reproducing inequities. In drawing heavily on our own precedent and interests, we did not know if we had a plan that would bring the benefits needed because we did not deeply understand the needs. The COVID-19 pandemic foregrounded inequities and laid bare many needs within our state. As we planned our own pivot, we paid much more deliberate attention to these, from tasking students with needs analysis to hosting listening sessions. In particular, we drew upon notions of speculative design.

Speculative design comes out of a critical turn in design. Concerns about designing commercial objects that meet short-term demand but contribute to climate change and social inequities have led some designers to focus more clearly on the complex systems their designs are part of and to more deliberately be part of designing futures that critique the present (Auger, 2013; Hunt, 2011). As such, speculative designs are sometimes offered more as art and commentary than as designed solutions. Rather than solving the problem, speculative designs prompt deeper reflection on the problem (Mitrović et al., 2021). Descriptions of speculative design methods emphasize embracing the complexity of contexts and systems.

To contend with this complexity, we draw upon an intersectional framework that provides insight into how power is dynamically and complexly distributed across structures, cultures, and disciplinary norms, resulting in inequitable experiences and outcomes (Collins & Bilge, 2020). The learning scientist brought this account of power dynamics into their work on the project, and we use this framework throughout to consider ways our context and problem frame brought focus to structures, culture, and disciplinary norms as sites for change. Structures, such as policies, often wield power in enduring ways. In our work, institutional structures that covertly shaped our decisions included funding formulas and

tenure expectations, both of which limit faculty availability to teach as an overload in interdisciplinary programs. Culturally, higher education institutions mask inequities through meritocracy—the belief that expertise and effort ensure advancement. Disciplinary silos, reified as schools of architecture, engineering, etc., reflect and sustain the pecking order across disciplines, while within these silos, norms collude with structures to maintain the status quo. Collectively, this complex set makes change hard.

It is for this reason that speculative design methods seemed promising, as these approaches typically include provocations that aim to critique disciplinary norms and the status quo (Ward, 2019). Many design methods fall under the umbrella of speculative design practice. We identified tools that might support us in considering the broader systems at play and aid us in stepping away from the expected.

Design Forge: Zine Exercise

The *Design Forge* took place in early June 2021 at a comparatively hopeful point in the pandemic, with New Mexico leading the nation in vaccinations. One of the first exercises at the *Design Forge* was to create a foldable zine detailing our place, social structures, power dynamics, and our intended change. Our initial individual work reflected diverse framings (refer to Table 1). Even the place varied, with designers

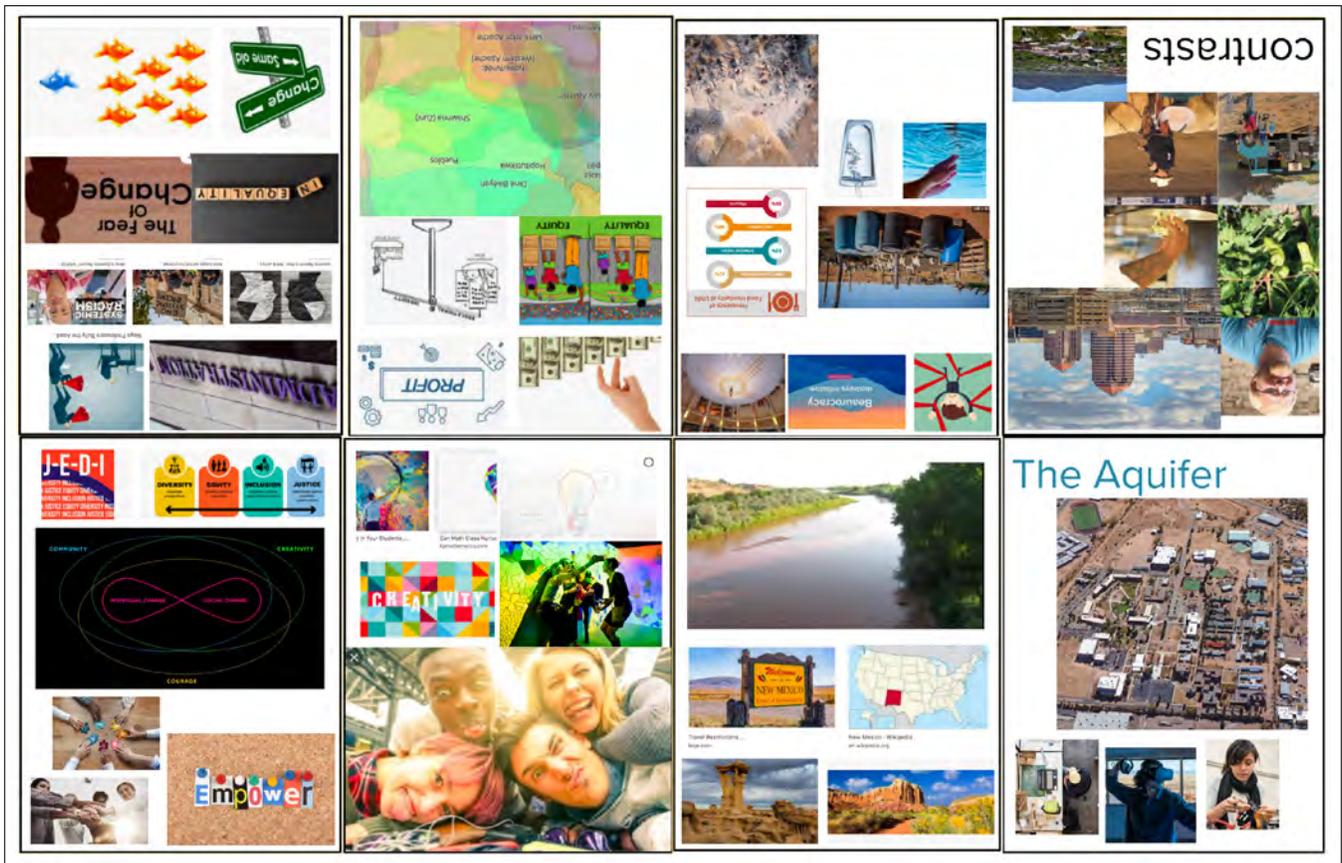


FIGURE 1. Screenshot of our zine.

PHYSICAL ENACTMENTS	SOCIAL STRUCTURES	POWER DYNAMICS	CREATING CHANGE
Water, classroom, campus, wild life, abandoned weeds, beautiful buildings	Reclamation, closed or uninviting, who has access to education, economic inequality	City controlled, money, clashing ideologies on space use, indecision impacts communities	Cross-discipline collaborations made possible and sustained, inviting space that brings in creatives from the community, a playful environment that fosters creativity
Landscape, rooted cultural history, science, art, multicultural	Rooted cultural history, wealth vs. poverty, commodification of culture, resource usage, water, electricity	Unceded land, who benefits financially, transplants	Empowerment, multiple voices, art as a social tool, collaboration, equity, inclusions, engage diverse stakeholders
Vacancy, disconnection, architectural decay, beautiful architecture	Culture disconnect, isolation, privilege, politics, displacement of people	Privileged citizens, reciprocity not extraction, government politics, political rights, educational privilege	Opportunity, beauty, economic development, innovation, awareness, inclusion
[Image of campus] This is difficult as the place is varied - or ill-defined for us right now	Policies that seem to prevent cross-unit collaboration, especially for teaching, lots of creativity / not much strategy, bureaucracies of multiple levels (institution, state), poverty	Serving those who think things should not be changed, those in higher SES? Not sure that is true. Streamlining institutional processes (easier to make T&P decisions if things are "normal / traditions")	Co-teaching that is sustainable. Design education that benefits NM directly and indirectly, policy that allows for greater agility, JEDI [justice, equity, diversity, inclusivity] design learning opportunities

TABLE 1. Individual framings; each row created by a different designer.

envisioning the original site in Santa Fe, our university campus, or the state as a whole. As noted previously, the open problem frame paired with our optimism was the invitation the trickster needed to sustain focus on the original site.

We were then tasked with merging these ideas quickly into a zine, using images and a few words (refer to Figure 1).

The front cover referenced the original idea—the Aquifer, paired with images of people typing at a computer, wearing an augmented reality headset, and using a multimeter. The back cover depicted New Mexico, emphasizing “contrasts” in text and images of rural and urban life. We depicted images of social structures that we agreed were barriers (red tape, bureaucracy, government, human contributions to

climate change, food insecurity). In terms of depicting power dynamics, we selected images related to profit, Native land, equality versus equity, fear of change, and systemic racism. In the final two pages, depicting how to create change, we included images referencing justice, equity, diversity, and inclusivity (JEDI), diverse teams, and colorful representations of creativity and collaboration. Thus, despite our different initial, individual positionings, the vision of inequitable structures and dynamics was maintained and even strengthened in the merged version. In this way, the pandemic—as a trickster—spotlighted extant inequities as sites for action (Auger, 2013; Hunt, 2011), even though each designer described different

physical enactments shaped by whether and how much they held onto the original place-based vision. We identified institutional structures that contributed to inequities, but also many societal structures that were beyond our sphere of influence.

Design Forge: Stakeholders and Futures

The next exercises asked us to consider stakeholders not at the table, to generate equity goals, and then to rapidly prototype a new project idea. In the first, we acknowledged that while community members seldom come to our campus—suggesting a lack of relationship—we also do not always know the potential collaborators to invite. We named that our university can be hard to play with and that as a large institution in a rural state, it tends to seem monolithic. One driver of these issues is resource scarcity, prompting competition rather than collaboration. We generated strategies to address access: referrals to other contacts from existing stakeholders, having open design conversations in planning stages and more on-campus events that are feasible (e.g., cover parking costs), making intellectual, physical, agentive space for stakeholders, and going to stakeholders.

Prompted to consider the next steps, we described establishing a market need and developing a value proposition. We agreed that resource sharing in a neutral location and efforts to identify and address the needs of more diverse

PREVIOUS EXPERIENCES & INSPIRATION	CURRENT EXPERIENCES TOWARD GOALS	FUTURE EQUITY GOALS
Rural studio out of Auburn - found object design	Mobile maker lab	Serves our students, potential communities we engage with
Field trips!!!! Getting out of classroom	360 camera-tours using Ricoh cameras	Class that is porous enough to allow community members to be with us, designing with, working with us (not just our students)
Our university's social justice certificate as model - could do design thinking (agile) certificate with culminating experience (Could count experiences outside the university - but need to decide what "counts")	Meeting stakeholders on location	Tasters embedded in courses
Design for America Chapter	Multiple bites at the apple to develop design wisdom (client wants *this,* but it is bad)	Take advantage of Canvas (free-for-teachers variant—easy to let others in free)
	Working with students to bring interdisciplinary focus could help create a program	Problem framing skills as power tools
	Partnering with industry & museums	Design appreciation / invitational space
		Interdisciplinary as joint expert-novice space

TABLE 2. Sample ideas generated after considering stakeholders.

stakeholders (and defining effective ways to work with them) were areas we wanted to grow. We identified that we had many under-utilized tools, like 3D printers and other makerspace tools. By pooling these in a common space, we recognized we might be able to also offer staffing and better access for students. Next, in our ideation of equity goals that followed this, a breadth of ideas emerged, again highlighting the lack of cohesion about the problem scope (refer to Table 2). For the first time, however, there was no mention of the original site, though elements of the original proposal are clearly present. For instance, the “tasters” in Table 2 reference the proposed “enchantments” in the Aquifer. The optimism of the time is reflected in the interactive, collaborative ideas put forth.

Next, we recognized the hand of the trickster-pandemic. Tricksters, known for their deception and shape-shifting ways, invent situations. Prompted to use rapid prototyping methods to envision our project if we had just one month to put it into place, we immediately shifted back to the original site, then more generally to Santa Fe, where we proposed a face-to-face workshop to be held before summer's end for students and community members to collaboratively document issues that prevent more ecological transportation modes like bicycling. We named specific people we could invite, such as the city planner. Drawing on our own experiences, we discussed the issues of narrow streets and sidewalks, and sidewalks that lacked curb cuts—a mobility issue more generally. We presented our prototype for feedback, and when a member of another team noted that clear solutions for requesting curb cuts already exist and can be acted on in a straightforward manner, we recognized that such problems offered few opportunities for students to build their “capacity to reframe problems.”

Thus, our initial broad problem space held many possible problems, with little sense of which way to head. Upon being tasked with rapid prototyping, we shaped a highly solvable problem frame. We had shifted from an overly broad to an overly narrow problem. The ambiguity of the open space sat in high contrast to the feasible solution of a workshop on environmental transit and curb cuts that, while it might solve an authentic and immediate problem, would not offer the learning opportunities envisioned. In this way, we used our abductive reasoning (Dorst, 2011) to quash ambiguity, tricked into locking out radical hope (Bendor, 2018) in exchange for certainty. As many trickster tales do, this deceit brought clarity and insight. We acknowledged the need to develop a more nuanced, focused, and specific—yet still open—problem, and that we seemed to be holding onto our original site without much clarity about why. This prompted the second design sprint with its focus on problem framing. In the intervening time, the students gathered information to aid us in our framing. The students investigated existing programs that focused on inter- or multi-disciplinary design, as well as programs simply described as interdisciplinary (refer to Figure 2).

They analyzed such programs and offered formal summaries of their analysis, such as “Technical skills/resources are BIG for these programs. The schools boast ample resources for their students and value future thinking. Most students come from different disciplines and therefore help each other grow and learn. They are socially-minded, and want to further understand and help their communities through interdisciplinary design thinking.” Importantly, this information-gathering process shaped how they engaged in design sprint activities; even though most of the students had less experience as designers, they had more knowledge of formal

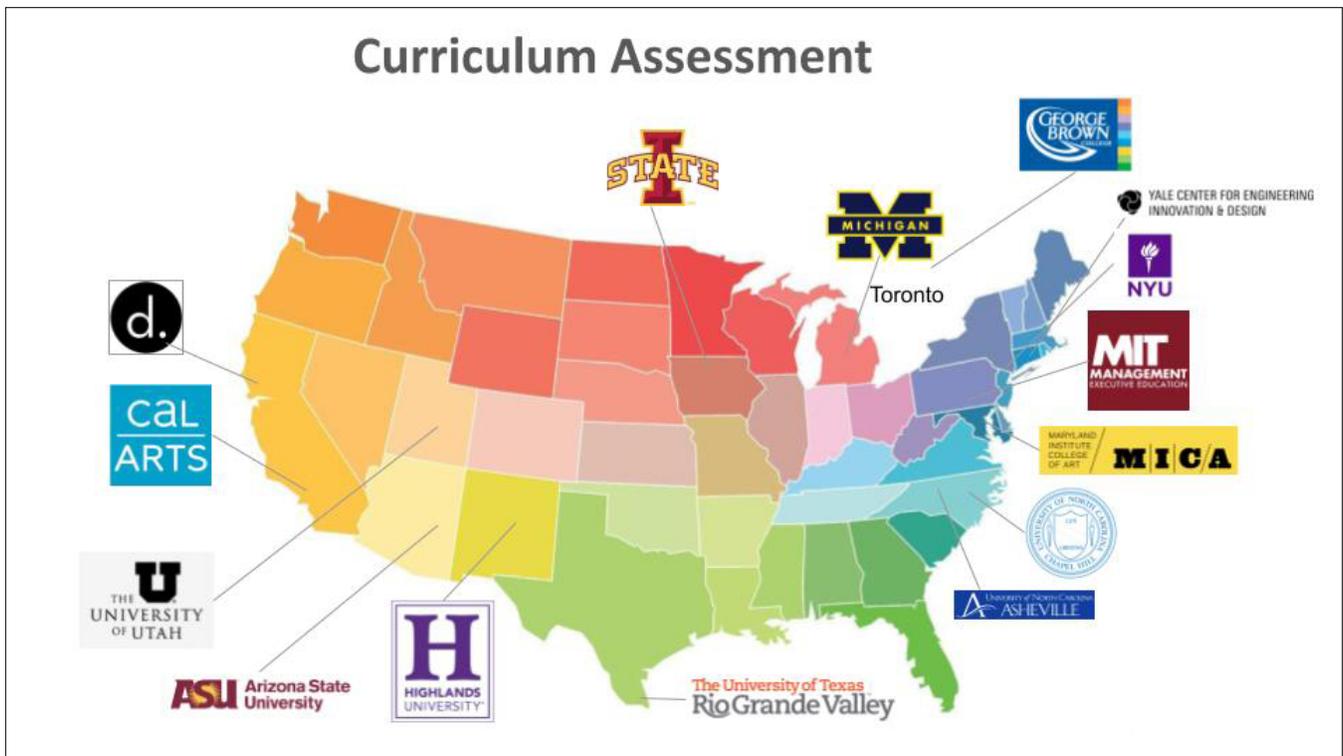


FIGURE 2. Screenshot from report on design programs produced by a student.

design education programs than the faculty. This knowledge positioned the students as capable contributors.

Problem Framing Workshop

One month later, led by the learning scientist in the role of facilitator, we walked through a sequence of problem-framing exercises, face-to-face but masked (per university requirements), in a new innovation space off campus. The facilitator began by prompting each person to share an example of bad design. They then explained, “We are surrounded by a lot of terrible precedent that inadvertently gets into our heads. We let ourselves recreate things that aren’t good instead of being more visionary and taking some time to get over a hurdle.”

They prompted members, working in three small groups, to list as many different solutions as they heard, while they recounted the history of the project, sharing screenshots of emails, websites (including from the Wayback Machine, <https://archive.org/web/>, for websites that had significantly changed over time), and newspaper articles. Members shared some of the solutions they identified, such as team teaching, a new design degree, community projects, a new certificate, etc. Yet the members encountered difficulty in naming specific problems solved by these solutions. The facilitator then scaffolded members to draft initial problem statements. The problems identified by the three groups diverged: (a) resources and financing to move forward; (b) the lack of interdisciplinary design at the university; and (c) that

students lack access to possible career pathways because of academic silos. These problems vary in the degree to which they reflect a root cause, and further, a root cause within the sphere of influence of the team.

Following a break and a meeting with industry, the groups identified additional stakeholders. They were notably consistent in naming students, university leadership, community members, and local industry. The facilitator prompted them to describe stakeholders’ needs, or, if unknown, how such needs might be identified. Members tended to attribute financial, learning, and prestige needs to internal university stakeholders. This included scholarships and strong applications for students, funding for faculty research, and the ability for the administration to boast about the university’s success to state and outside audiences. Members agreed that students, faculty, and administrators might need to learn about design education and why it could be valuable in students’ future careers. In contrast, when considering external stakeholders like museums, organizations, and communities, they suggested need-finding strategies of listening, visiting, and joint project planning.

Next, the facilitator guided them to use the five-whys technique, an approach that aims to identify root causes and categorize them as within or outside of the team’s sphere of influence. The worksheet offered guidance: “Create a 5 Whys network based on the problem. Repeatedly ask and answer ‘Why does this happen?’ Provide detail and remember to consider diverse perspectives on the problem. Focus on

Five whys network

Create a **5 Whys network** based on the problem. Repeatedly ask and answer "Why does this happen?" Provide detail and remember to consider diverse perspectives on the problem. Focus on behaviors that contribute to the problem. Try to identify more than one cause. Your goal is to get to root causes that you have influence over. See example on the next page.

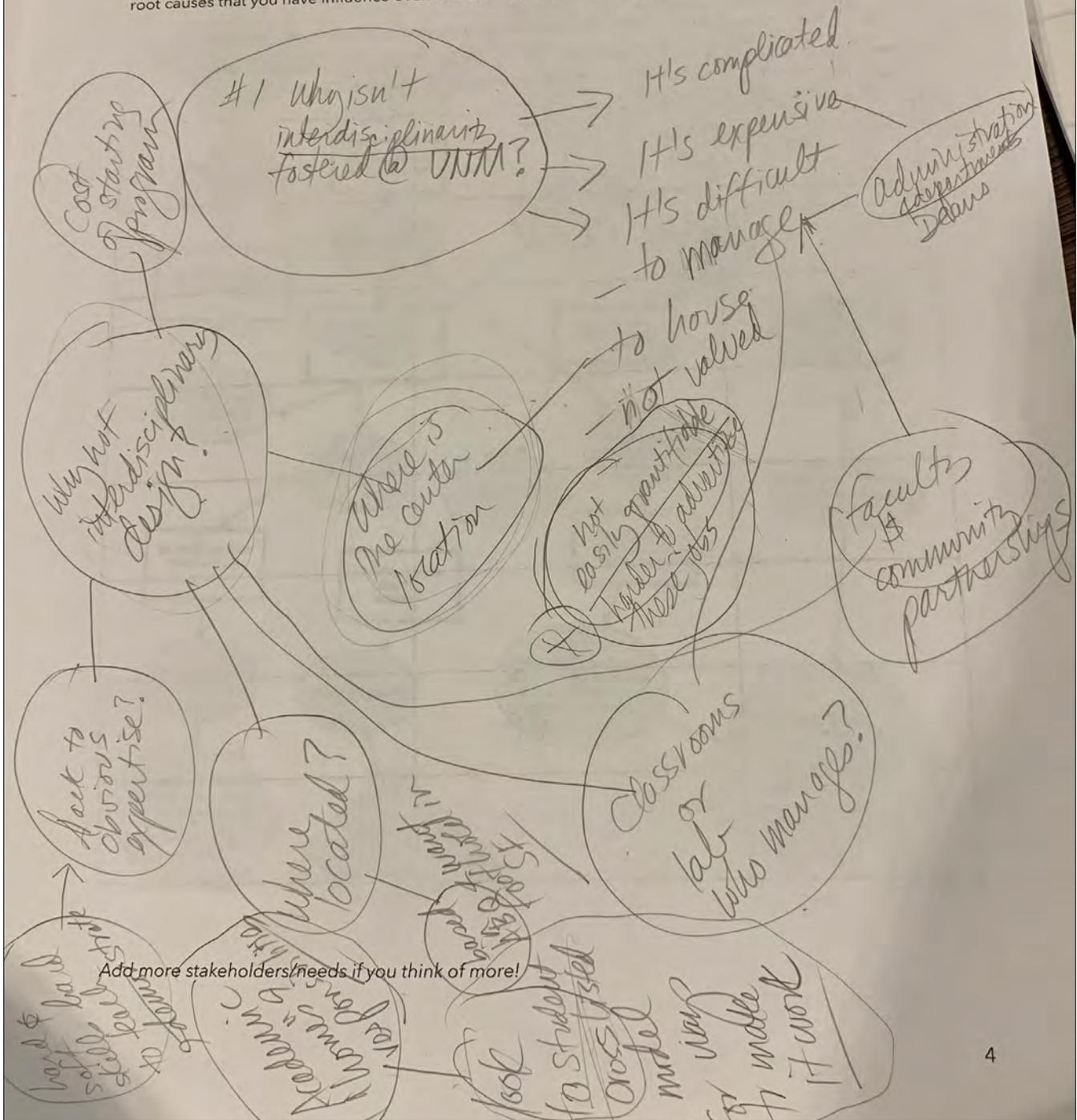


FIGURE 3. Sample of Five Whys as a network.

behaviors that contribute to the problem. Try to identify more than one cause. Your goal is to get to root causes that you have influence over" (refer to Figure 3). The facilitator hoped that the emphasis on "influence" would productively

constrain focus to root causes that the team could act upon in consequential ways.

Two groups focused primarily on siloing in academia; the other, shifting somewhat from a focus on career pathways,

Interdisciplinary design skills are valuable to the emerging creative technology economy, but few people in New Mexico have such skills. Although New Mexico is well known for its designs, and New Mexicans have traditionally engaged in many forms of design, these traditional knowledges are not well integrated with formal design practices or with creative technology. Such integrations can provide motivation and inspiration for learners. Currently, there are no programs in the state that prepare learners with the constellation of skills needed in the creative technology economy or to apply design methods and practices more broadly and strategically, such as reframing problems.

One barrier is that interdisciplinary teaching is not widely fostered, in part because of structures, cultures, and norms that hinder it: (a) The disciplinary silos of departments and the policies in place that govern new courses, programs, and departments constrain what faculty attempt or believe can succeed. (b) The tenure system disincentivizes interdisciplinary teaching as pre-tenure faculty may fear such teaching would be viewed as not meeting the departmental needs they were hired for. (c) Amidst long-standing budget crises on campus, department siloing is enhanced by felt scarcity and competition for limited resources; while temporary funds may be offered to experiment with interdisciplinary teaching, without a commitment of recurring funds to sustain such approaches, they will continue to be short-lived. Another barrier relates to the transdisciplinary nature of design work; design problems affect diverse stakeholders in various ways, with those already marginalized most likely to be negatively impacted by un-/under-resolved issues or solutions that widen gaps. Avoiding unintended consequences requires transdisciplinary approaches that mitigate the impacts of power dynamics. Learning to work in transdisciplinary ways with communities is complex and therefore not a single-shot process.

Without strategic, sustainable, and creative approaches to interdisciplinary design education, the NM creative technology workforce will continue to recruit from outside of NM; NM students who aim to do such work will have to find other routes; people will continue to feel powerless about problems they face in their work or communities rather than using design practices to strategically reframe them, leaving persistent problems unsolved.

TABLE 3. Formal problem statement.

explored the perceived lack of interest and awareness about design. These foci carried over into their revised problem statements, which offered more detailed, focused descriptions of the problem and its consequences than their first drafts displayed. The facilitator combined these statements into a single formal problem statement (refer to Table 3), which they shared with the team for comments and feedback, and with the provost, who offered encouragement.

Thus, supported by a sequence of problem-framing tools, we shaped a more focused problem statement. In doing so, we wrested framing agency away from the trickster, making consequential decisions that left the problem open and ill-structured, yet specific and focused (Svihla et al., 2019; Svihla & Peele-Eady, 2020; Svihla et al., 2021) and with a vision that rekindled radical hope.

THE WRONG THEORY PROTOCOL

The Wrong Theory Protocol (WTP) is a speculative ideation technique in which designers write a high-level problem statement, and then generate harmful and humiliating ideas before generating beneficial ideas (Svihla & Kachelmeier, 2020a, 2020b, 2022). This process, especially generating humiliating ideas, helps designers propose beneficial ideas that are jointly creative and empathetic (Svihla & Kachelmeier, 2020a, 2020b, 2022).

The facilitator walked the groups through this activity after sharing the merged problem statement (refer to Table 3). The three groups developed diverse, terrible ideas: creating

physical silos; treating students in non-STEM majors as “untouchables” including by color-coding their clothing; creating an explicit ranking and funding system to value engineering students more than other majors; enacting policy to ensure businesses would not hire local talent or people of color; doubling faculty workload and making faculty use outdated and dysfunctional software to teach exclusively online; removing any funding or resources from students, including eliminating student organizations and advisement; an anti-dean’s list; and evaluating students using public, high stakes, fact-based trivia contests.

By acting upon the problem statement using speculative ideation methods, we met the trickster directly, engaging as co-designers. In addition to the worsened issues of siloing, we recognize the specter of the pandemic through faculty eyes, as we proposed somewhat worse versions of what the pandemic dealt us in emergency remote teaching with a non-intuitive learning management system. Many of the humiliating ideas were slight funhouse mirror distortions of reality. After all, many funding mechanisms across campus are already inequitable, and many grading systems already offer humiliation.

Whether by exposing these faults explicitly or by provoking new or stronger commitments to overcome them, the process supported us to propose specific yet open solution paths that clearly related to the underlying issues of silos. In generating beneficial ideas after discussing our harmful and humiliating ideas, members identified three main solution paths: a flexible, interdisciplinary design certificate program;

design events, such as a symposium; and shared interdisciplinary design facilities and spaces.

In reflecting on these solution paths, we note that none of them situate structures—namely the departmental silos—as sites of action. Rather, they aimed to foster new activities and programs *within* those structures, layered with new disciplinary norms in the form of shared programs and oversight of facilities. We wonder why we did not set our focus more directly instead on ways to breach these silos, to trouble the very structures that stood in the way. Perhaps the attention to the sphere of influence—without also strategically considering ways to widen that sphere—prompted this smaller scope. Perhaps, as it was late in the day, at a time when navigating face-to-face interactions was both joyful and stressful, we were simply too tired to be so ambitious. In this, we recognize the trickster’s work again.

SOLUTION-FOCUSED SPRINT

Several weeks later, as the Delta variant of COVID-19 was just starting to cause a rise in breakthrough cases among the vaccinated, we held another face-to-face design sprint, on our campus. By this point, the university was no longer requiring masks indoors—a decision that would be reversed a week later as cases rose further.

We aimed to expand upon the three design ideas developed in the problem framing workshop using a template developed by the facilitator, with sections for describing the idea, means to evaluate its success, a description of existing and potential market, investments and resources needed, potential return on those investments, regional competitors, potential connections to Santa Fe, and other unknowns or next steps. By including “How does/could Santa Fe play a role? What has to happen in order for Santa Fe to play a viable role?” the facilitator hoped to keep more members focused on the primary task while offering a parking lot for ideas that might otherwise rekindle the original project. The template displayed an eagerness to set our plans into

motion, asking members to describe, “What is the minimum viable product version we can set up now?” And separately, “What is the aspirational version?” This also reflects the experiences from the *Design Forge* where we were tasked with proposing a rapid prototype.

Initially, the plan presented by the facilitator was to populate as much of the template as possible in a burst of activity. A member countered this plan, wanting to take advantage of the chance to interactively discuss and generate ideas. Acting on this appealing idea, we talked in three groups, adding ideas to the template, but leaving many sections vacant. These conversations also broadened the focus, introducing new ideas, reintroducing previously-considered ideas, and contending with some new unknowns. For instance, the group focused on design facilities proposed that, because of the pandemic, online and hybrid spaces might be needed. Thus, the pandemic as co-designer returned, re-introducing ambiguity and shifting in shape.

The group that focused on design events listed many words and phrases, but few sentences: “Continuity - connection from one thing to the next; arc to the workshops; connect to the community; Targeted advertising; [...] Wifi vans; field trip incentives for students; Film students/interns to help make a video in advance; bite-size chunks; teasers.” From this brainstorming emerged a newly recognized need for a website and listserv, but little sense of the purpose or aims of a potential symposium. In this, we recognize the trickster as situation inventor, as the pandemic raised the appeal of a design event so much that it seemed to require no explicit purpose. However, we also made critical progress on the design certificate. We set learning goals and objectives for the design certificate (refer to Table 4). We identified over 50 potential courses that could be part of the design certificate. Perhaps because of this long list, we also wondered if we needed “one required class to help create connections & crossovers?”

LEARNING GOALS	LEARNING OUTCOMES
Students will understand various design practices and methods.	Students will be able to: <ul style="list-style-type: none"> Define an ill-structured problem in light of stakeholder needs Enact specific design methods and practices to guide/direct design process Develop prototypes and evaluate the degree to which they meet aims and needs Develop and communicate a final designed solution Evaluate the impacts of the designed solution on diverse and minoritized stakeholders
Students will appreciate the nature of design and work of designers across fields.	Students will be able to: <ul style="list-style-type: none"> Conduct design practices and methods in ethical, culturally responsive ways Use interdisciplinary design to enhance their problem solving skills

TABLE 4. Learning goals and objectives associated with the certificate.

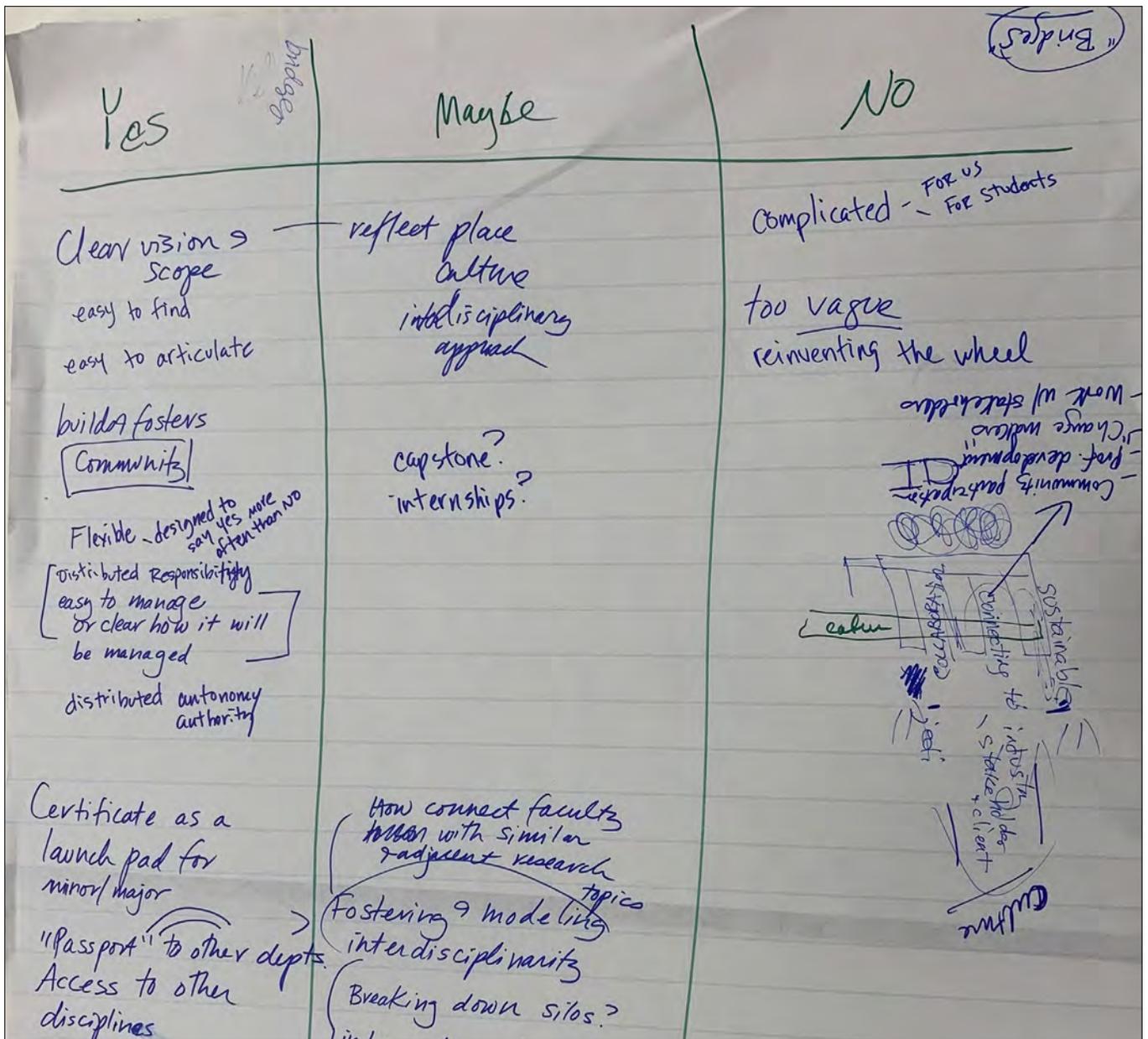


FIGURE 4. Sample of one group's effort to prioritize ideas, including a beginning sketch on the right—mostly upside down—of a framework.

Concerned about the breadth of new ideas and their connection to problems the team had identified, the facilitator pivoted the afternoon plan. After returning from lunch—with most members unmasked—the facilitator prompted them to sort their ideas into three categories: yes, maybe, and no (refer to Figure 4). Members identified “clear vision, easy to articulate” as an attribute of the certificate, which prompted a less flexible vision with narrowly-scoped concentrations in interaction design, digital fabrication, and rural community design, largely linked to career pathways. Another group sketched frameworks for their vision, suggesting sustainability should be foundational to our work, defining the term both in ecological and systems

theoretic ways. The facilitator, still masked and flustered by the unmasked members, asserted that sustainability was actually *the problem*—that too many oppressive systems and structures were in fact highly sustainable, evidenced by sustained inequities.

We again recognize the pandemic as a speculative co-designer and trickster, shapeshifting and introducing ambiguity. While most felt protected by the vaccine, not all did. We thus contended with multiple ambiguities, with the pandemic covertly shaping engagement.

Indeed, the ambiguity of the situation was visible in shifting university policy: a draft vaccine mandate policy

was circulated in May, replaced with “aspirational” but not required vaccination aims in June. This was, in turn, replaced with an updated vaccination policy in August paired with a strong push to act as if we would be teaching in post-pandemic, “normal” situations. Amidst this, while the members agreed that environmental and social justice should be core values and aims, a speculative approach prompted critical reflection (Mitrović et al., 2021), spotlighting concerns about environmental sustainability versus sustained inequities.

Rather than proposing a cohesive vision for interdisciplinary design education capable of breaching silos, we formed comparatively compliant and more narrowly-scoped plans that fit neatly within institutional structures.

CONCLUDING THOUGHTS

In contending with speculative design, Nardi (2015) poses questions about which future we design for—the desired future, or the expected future? While we sought to craft visions of a desired, more equitable, and sustainable future, the COVID-19 pandemic brought attention to both existing inequities and entangled uncertainty. In this way, the pandemic re-situated our designing by foregrounding inequities (Nardi, 2015) in ways that promoted engagement with uncertainty, a necessary ingredient for radical hope—a form of design work that, while still acknowledging value in small steps toward cumulative progress, embraces uncertainty and leans into ambiguity (Bendor, 2018). In this way, our most radically hopeful ideas came out of entanglements (Ingold, 2008) with the trickster-pandemic. We faced the challenges noted in engaging speculative design as a process of navigating tensions between “production and reflection, analysis and making, critique and creation” (Ward, 2019).

However, without having adequate ways to meet the trickster face-to-face, we ultimately failed to put forward a problem frame that rendered institutional structures into sites of action. The trickster introduced ambiguity that made ambition more challenging. After multiple workshops, our problem frame reflected the formal statement in Table 3, and our design solutions set comfortably into institutional structures. Yet, with this insight, we anticipate continued collective work that, as we wrest more framing agency from the trickster, and leverage tools to make power dynamics visible, we may also relocate the ambition to revisit those structures.

Our purpose in writing this case was not to showcase a particularly creative solution to a vexing learning problem, or even to highlight the sequence of steps we took to design, but rather, to share our process as tangled with a speculative co-designer and trickster. By acknowledging the agency possessed by the pandemic, we can better understand our design decisions. By casting the pandemic itself—with its

shape-shifting prowess—as a speculative designer and trickster, we recognize the breadth and ambiguity of the initial problem frame as a fecund and inviting ground for such a trickster. Indeed, as we consider the Omicron variant and its rapid, record-setting case rates, we see the glint of the tricksters’ eyes again.

We also realize that treating the pandemic as a trickster offers a ludic stance characteristic of many responses to the pandemic (Raab et al., 2021), but certainly not all. We do not wish to diminish the devastating impacts of the pandemic. Our aim in treating the pandemic as an actor and co-designer allowed us to recast and reflect on our own engagements as designers.

ACKNOWLEDGMENTS

We acknowledge support from the university in the form of stipends for participating students, contributions from stakeholders, and support in the form of workshops and community from Elon University’s Design Forge and access to Q Station for holding a design sprint. This material is based upon work supported by the National Science Foundation under Grant No. 1751369. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

REFERENCES

- Auger, J. (2013). Speculative design: Crafting the speculation. *Digital Creativity*, 24(1), 11-35. <https://doi.org/10.1080/14626268.2013.767276>
- Babcock-Abrahams, B. (1975). “A tolerated margin of mess”: The trickster and his tales reconsidered. *Journal of the Folklore institute*, 11(3), 147-186. <https://doi.org/10.2307/3813932>
- Bendor, R. (2018). Sustainability, hope, and designerly action in the anthropocene. *interactions*, 25(3), 82-84. <https://doi.org/10.1145/3194351>
- Cerulo, K. A. (2009). Nonhumans in social interaction. *Annual Review of Sociology*, 35, 531-552. <https://doi.org/10.1146/annurev-soc-070308-120008>
- City of Santa Fe. (2018). *Final Planning Guidelines for the City’s Midtown Property*. Retrieved May 1, 2022 from https://www.santafenm.gov/document_center/document/8889
- Collins, P. H., & Bilge, S. (2020). *Intersectionality*. John Wiley & Sons.
- Dorst, K. (2011). The core of ‘design thinking’ and its application. *Design Studies*, 32(6), 521-532. <https://doi.org/10.1016/j.destud.2011.07.006>
- Dorst, K. (2019). Co-evolution and emergence in design. *Design Studies*, 65, 60-77. <https://doi.org/10.1016/j.destud.2019.10.005>
- Fisher, T. (2012). Design as trickster. In P. Israsena, J. Tangsantikul, & D. Durling (Eds.), *Research: Uncertainty contradiction value* (pp. 512-525). Design Research Society. <https://dl.designresearchsociety.org/drs-conference-papers/drs2012/researchpapers/38/>

- Hunt, J. (2011). Prototyping the social: Temporality and speculative futures at the intersection of design and culture. In A. J. Clarke (Ed.), *Design Anthropology* (pp. 33-44). Springer. https://doi.org/10.1007/978-3-7091-0234-3_3
- Hynes, W. J., & Doty, W. G. (1997). *Mythical trickster figures*. The University of Alabama Press.
- Ingold, T. (2008). Bindings against boundaries: Entanglements of life in an open world. *Environment and Planning A: Economy and Space*, 40(8), 1796-1810. <https://doi.org/10.1068/a40156>
- Jonassen, D. H. (2000). Toward a design theory of problem solving. *Educational Technology Research and Development*, 48(4), 63-85. <https://doi.org/10.1007/BF02300500>
- Knappett, C., & Malafouris, L. (2008). *Material agency: Towards a non-anthropocentric approach*. Springer. <https://doi.org/10.1007/978-0-387-74711-8>
- Mitrović, I., Auger, J., Hanna, J., & Helgason, I. (Eds.). (2021). *Beyond speculative design: Past – present – future*. SpeculativeEdu; Arts Academy. <https://speculativeedu.eu/beyond-speculative-design-past-present-future-online/>.
- Nardi, B. (2015). Designing for the future: But which one? *interactions*, 23(1), 26-33. <https://doi.org/10.1145/2843592>
- Raab, M. H., Döbler, N. A., & Carbon, C.-C. (2021). A game of COVID: Strategic thoughts about a ludified pandemic. *Frontiers in Psychology*, 12, 2392. <https://doi.org/10.3389/fpsyg.2021.607309>
- Schön, D. A. (1992). Designing as reflective conversation with the materials of a design situation. *Research in Engineering Design*, 3(3), 131-147. <https://doi.org/10.1007/BF01580516>
- Svihla, V., Gomez, J. R., Watkins, M. A., & Peele-Eady, T. B. (2019). Characterizing framing agency in design team discourse. *Proceedings of the American Society for Engineering Education Annual Conference & Exposition*, 1-19. <https://doi.org/10.18260/1-2--32505>
- Svihla, V., & Kachelmeier, L. (2020a). The Wrong Theory Protocol: A design thinking tool to enhance creative ideation. *Proceedings of the Sixth International Conference on Design Creativity*, 223-230. <https://doi.org/10.35199/ICDC.2020.28>
- Svihla, V., & Kachelmeier, L. (2020b). The Wrong Theory Protocol: A pre-ideation technique to enhance creativity and empathy. *Proceedings of the American Society for Engineering Education Annual Conference & Exposition*, 1-17. <https://doi.org/10.18260/1-2--35383>
- Svihla, V., & Kachelmeier, L. (2022). Latent value in humiliation: A design thinking tool to enhance empathy in creative ideation. *International Journal of Design Creativity and Innovation*, 10(1), 51-68. <https://doi.org/10.1080/21650349.2021.1976677>
- Svihla, V., & Peele-Eady, T. B. (2020). Framing agency as a lens into constructionist learning. *Proceedings of Constructionism*, 313-324. <http://www.constructionismconf.org/wp-content/uploads/2020/05/C2020-Proceedings.pdf>
- Svihla, V., Peele-Eady, T. B., & Gallup, A. (2021). Exploring agency in capstone design problem framing. *Studies in Engineering Education*, 2(2), 96-119. <https://doi.org/10.21061/see.69>
- Ward, M. (2019). *Critical about critical and speculative design*. <https://speculativeedu.eu/critical-about-critical-and-speculative-design>
- Wertsch, J. V., Tulviste, P., & Hagstrom, F. (1993). A sociocultural approach to agency. In E. A. Forman, N. Minick, & C. A. Stone (Eds.), *Contexts for learning: Sociocultural dynamics in children's development* (pp. 336-356). Oxford University Press.